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what is a day's labour once in ten years? Let those, then, whom the love of improvement and their own reputation stimulates, try it; I am confident that their endeavours will be crowned with success, and with the pleasure of having eminently contributed to the benefit of mankind.

I am, Sir, &c. &c.

L. HEBERT,

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*Vice-President, &c. &c.*

## No. VIII.

### DETACHED ESCAPEMENT.

*The Large SILVER MEDAL and FIVE POUNDS were presented to Mr. ROBERT MAY, New Road, Deptford, for his Detached Escapement: a Model of which has been placed in the Society's Repository.*

THE difficulty is so great of effecting a completely detached escapement, in which the alternate impulses given to the balance shall be equal and independent of the train, that, notwithstanding its theoretical advantages, watch-makers have been driven to the necessity of abandoning it, and of equalising the oscillations of the balance by other means. The escapement invented by

Mr. May is, on the whole, sufficiently simple and completely detached, as the balance receives its impulse from two springs quite independent of the train. It belongs to that species called remontoire; and though it has been hitherto constructed only in model, and has not been actually attached to a watch, the ingenuity of the invention appeared to the Society worthy of their medal and of being given to the public.

*a a*, figs. 1 and 2, plate ii. are the upper-frame plate which supports the escapement; *b* is the balance, the arbor or axis of which passes through the plate *a a*, and bears the short pallat *c* and the long one *d*; *e* is the escapement wheel; *f* and *g* are two pallats alternately raised by the teeth of the escapement wheel; *h h* are two springs which depress the pallats to their bearings on the pins *i i*, and at the same time put in action the impelling levers *k l*.\* These latter are attached to the pallats by means of two screws working through oblong holes, so as to allow a certain degree of adjustment; the screw of pallat *f* is shewn at *m*; that of pallat *g* is on the under side. The locking pallat *n* has an arm attached to its arbor; it is turned up and pierced at the end by a square hole, shewn separate at *q*, fig. 4; *r* is a hair spring fastened at one end to a stud on the arm *o*, and the other end passing through and projecting a little beyond the square hole at the turned-up extremity of the arm. (The details of the locking pallat, with its arm, are shewn in figs. 3, 4, 5.) *s* are two banking pins at the back of the locking pallat to limit its motion.

Fig. 6 is an elevation to shew the position of the works: *v* is an additional piece on the cock *w*, on which

\* In fig. 2 the lever *l* is erroneously marked *e*.

the upper pivots of the pallats, *f* and *g*, are fixed; it is also shewn in position in fig. 1, but has been removed in fig. 2; *z* is the balance spring; the lower plate, which supports the stud 1, is not shewn.

The following is the action of the escapement:—The tooth *t* (fig. 2.) of the escapement wheel, impelled by the mainspring or weight, has passed along the face of the pallat *f*, raising it, and, at the same time, slightly contracting the spring *h*; the tooth *u* is in contact with the hook of the locking pallat *n*, and the balance, with its pallats or arms, *c* and *d*, is moving in the direction indicated by the arrow. When *d* has arrived at the point marked by a star, the unlocking pallat *c* will have come in contact with the end of the hair spring *r*, will have forced it in contact with the farther side of the square hole in which it is placed, will have moved the lever *o*, and with it the locking pallat *n*, so as to liberate the tooth *u*; at the same time the tooth *t* drops off the end of the pallat *f*, and thus allows the spring *h* to expand; the consequence of this is, that the pallat *f* drops till it is stopped by the pin *i*, and the impelling lever *k* strikes against the pallat *d*, and thus gives its impulse to the balance *b*. Immediately afterwards, the tooth of the escapement wheel that is in contact with the pallat *g* moves along its face, compresses its spring *h*, slightly depresses the impelling lever *l*, so as to enable the pallat *d* to clear it, and brings it in a position to give its impulse to the same pallat on its return; at the same time, the tooth of the escape wheel preceding *u* has become locked on the other hook of the locking pallat *n*, and the parts are all brought to the position shewn in fig. 1.

It is obvious that, on the return of the balance, the

pallat *d* would not come in contact with the lever *o* of the locking pallat, if it were not that the hair spring *r*, as soon as it got free from the unlocking pallat *c*, had returned, by its own recoil, from the side to the middle of the square hole at the end of the lever; and in so doing, had advanced just far enough to be acted on by the unlocking pallat on its return.

The best form for the springs *h h* would be that of the pendulum spring, as there would be no friction.

The proposed advantages of the above construction are—1st. The impulse given to the balance by the two springs *h h* is equal, the springs being so. 2d. The train, not being concerned in giving the impulse, need not be an expensive one, neither need any of the holes to be jewelled. 3d. The whole of the friction on the balance is that which exists between the impelling levers and the pallats of the balance, and that is very little, as the levers describe small axes of a large circle. 4th. The balance is at liberty to move almost twice round, and therefore will probably not want any banking.